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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
WERNER, BRIAN P	

ART UNIT	PAPER NUMBER
2621	

DATE MAILED: 05/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/980,888	SATO ET AL.	
	Examiner	Art Unit	
	Brian P. Werner	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 10/5/2004

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-19 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-19 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 12/13/04 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 5, 2004 has been entered.

Response to Amendment

2. The claim amendment and arguments received on October 5, 2004 has been entered. Claims 1-19 remain pending. The corrected drawings received on December 13, 2004 have been entered.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-4, 9-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Uomori (US 5,726,704 A) and Sundahl et al. (US 6,094,215 A).

The Uomori Reference

Regarding independent claim 1, Uomori discloses:

A method comprising (Note: the embodiment relied upon by the examiner is embodiment 4, beginning at column 13, line 23 and concluding at column 15, line 33; figures 16-18 relate to this embodiment):

determining a position of an object in a first image (figure 18, "A_L"; "points AL and AR indicate the same point in the same object in the left and right images, respectively" at column 14, line 23);

determining a position of an object in a second image (figure 18, "A_R"; "points AL and AR indicate the same point in the same object in the left and right images, respectively" at column 14, line 23); and

moving one of the first image or the second image so that the object in the first image coincides with the object in the second image (figure 18, "Δx_{ave}"; "the right image is shifted ..." at column 14, line 27; "the entire images are moved horizontally" at column 14 line 33).

Regarding independent claim 9, Uomori discloses an apparatus corresponding to method limitations addressed with respect to claim 1 above (i.e., refer to Uomori figure 16). Regarding the means-plus-function language, which is interpreted by the examiner with respect to 35 USC

112, sixth paragraph, the structure of Uomori figure 6 is equivalent to the structure disclosed by the applicant at figure 9.

Regarding claim 11, Uomori discloses a shift amount setting means (in the fourth embodiment, this limitation is met by at least numeral 30 of figure 16, which determines the shift amount as described at column 13, lines 61-65 and column 14, lines 41-60; FYI this limitation is also met by the "ά" value at column 14, line 64; this limitation is also met by the fifth embodiment of Uomori, e.g. at figure 19, numeral 36).

Regarding claim 12, Uomori discloses a shift mode setting means ("can be set to a prescribed binocular parallax value ά" at column 14, line 66).

Differences

Regarding independent claims 1 and 9, while Uomori discloses a stereo image pickup apparatus (e.g., figure 4A, numeral 37), Uomori does not teach that:

the first image is picked up with a pickup apparatus in a predetermined first state and the second image is picked up with the pickup apparatus in a second state different from the first state (Note 1: regarding claim 1, this limitation recites specific structure in a method claim; the structure is given weight because is it necessary for performing the method; Note 2: regarding claims 1 and 9, the structure limitation is construed as a single image pickup apparatus that changes its physical state in order to pick up a second image, such as but not limited to the various embodiment of the applicant's disclosure).

The Sundahl Reference

Regarding claims 1 and 9, Sundahl discloses a system in the same field of stereoscopic image processing and addresses the same area of 3D image capture, wherein Sundahl teaches a single image pickup apparatus (figure 1, numeral 104; "single camera" at column 2, line 12) picking up both images (as depicted in figure 1), with the image pickup apparatus is in a different state when picking up the second image ("second location" at column 1, line 58).

Regarding claims 2 and 13, Sundahl teaches parallel movement of the single image pickup apparatus ("lateral translation illustrated by arrow 120" at column 2, line 45).

Regarding claims 3 and 14, Sundahl teaches rotational movement of the single image pickup apparatus ("may include a rotation motion illustrated by arrow 124" at colu8mn 2, line 46).

Regarding claim 10, Sundahl teaches a frame image generating means (figure 1, numeral 136) generating a frame image based on the moved at least one of the first and second images ("The digital image is stored in memory device 136" at column 3, line 41; this is equivalent to applicant's disclosed structure which is also a memory at applicant's figure 9, numerals 61 and 62).

Regarding claims 4 and 15, Sundahl teaches the pickup apparatus as having a condenser type optical means (the digital camera depicted in figure 1 has a lens; a condenser lens is a converging lens, which is the type of lens used by cameras) disposed between an image pickup element ("CCD" at column 3, line 33) and a target object (figure 1, numeral 108), movable to any position holding an optical axis parallel to the pickup element (the optical axis of digital

cameras have a fixed relationship with the CCD; even when the camera is moved from the first to the second position, and even if the lens is focused, the optical axis remains fixed).

The Combination

It would have been obvious at the time the invention was made to one of ordinary skill in the art to utilize a single image pickup apparatus as taught by Sundahl, in place of the two cameras of Uomori (e.g., Uomori figure 24A, numeral 37), in order to capture both images by repositioning the single camera as taught by Sundahl. One of ordinary skill would be motivated to make this substitution in order to simplify and thus reduce to cost of the two-camera image pickup apparatus of Uomori (i.e., "the problem with using two cameras is that it is more expensive than a single camera arrangement" at Sundahl column 1, line 35).

5. Claims 1, 5, 6, 9, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Uomori (US 5,726,704 A) and Pritchard et al. (US 5,157,484 A).

The Uomori Reference:

Regarding claims 1 and 9, Uomori discloses a method and apparatus as described above.

Differences:

Uomori does not teach a single image pickup apparatus (i.e., a single camera) picking up both images as described above.

The Pritchard Reference:

Regarding claims 1 and 9, Pritchard discloses a system in the same field of stereoscopic image processing, where he addresses the same area of 3D image capture, wherein Pritchard teaches a single image pickup apparatus (figure 11; "single camera" at column 10, line 25) picking up both images (as depicted in figure 10, by axes 136 and 135), with the image pickup apparatus is in a different state when picking up the second image (in a first state to pick up the first image, the "shifter 131 is not rotated" and in the second state, the "shifter 131 is rotated" at column 12, lines 1-3).

Regarding claims 5 and 16, the angle controlling means disposed between a pickup element and a target object (as depicted in figure 10) controlling an outgoing angle of light emitted to a pickup face of the pickup apparatus (as depicted by the axes 136 and 135 in figure 10) where the first and second states are controlled by first and second angles of the angle controlling means (in a first state to pick up the first image, the "shifter 131 is not rotated" and in the second state, the "shifter 131 is rotated" at column 12, lines 1-3).

Regarding claims 6 and 17, Imsand does not teach the angle controlling means as comprising a variable apex-angle prism (figure 10, numeral 131 is a prism in that it bends light, where its apex angle is variable by rotation as described above and depicted in the figure).

The Combination:

It would have been obvious at the time the invention was made to one of ordinary skill in the art to utilize a single image pickup apparatus as taught by Pritchard, in place of the two cameras of Uomori, in order to capture both images by repositioning the incoming light angle as

taught by Pritchard (i.e., at figure 10). One of ordinary skill would be motivated to make this substitution in order to simplify the image pickup apparatus by obviating the problems associated with a two camera system, such as "constant alignment adjustment" (Pritchard, column 3, line 33), the requirement for a "good deal of operator skill" (Pritchard, column 3, line 27), and the need for a "special mount to hold two cameras ... [which] makes it large and heavy" (Pritchard, column 3, line 38).

6. Claims 1, 7, 8, 9, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Uomori (US 5,726,704 A) and Lia (US 5,222,477 A).

The Uomori Reference:

Regarding claims 1 and 9, Uomori discloses a method and apparatus as described above.

Differences:

Uomori does not teach a single image pickup apparatus (i.e., a single camera) picking up both images as described above.

The Lia Reference:

Regarding claims 1 and 9, Lia discloses a system in the same field of stereoscopic image processing, where he addresses the same area of 3D image capture, wherein Lia teaches a single image pickup apparatus (figure 6, numeral 22) picking up both images (as depicted by the optical path division depicted in figures 2 and 4; e.g., in figure 2, the right image is picked up and in

figure 4, the left image is picked up), with the image pickup apparatus is in a different state when picking up the second image (the left and right shutters of numeral 30 are open and closed in the different states as depicted in figures 2 and 4).

Regarding claims 7 and 18, Lia teaches a light transmitting means with a light entering face and a light exiting face formed parallel to each other (figure 2, numeral 26) and arranged on a path between a pickup element and a target object (numeral 26 is "disposed at the distal end of the camera 21" at column 3, line 58) to be insertable at a predetermined angle (numeral 26 is at a fixed angle, and is insertable into the optical path when the shutters 30 are opened and closed), where a first state the light transmitting means fails to be inserted on the path (e.g., in figure 2, the left shutter is closed) and in a second state, the light transmitting means is inserted in the path (e.g., figure 4, the left shutter is opened, thus inserting the plate 26 into the optical path).

Regarding claims 8 and 19, Lia teaches the light transmitting means as comprising a transparent parallel plate (plate 26 in figure 2 is a window, having parallel entry and exit surfaces as depicted; it is also transparent; i.e., "A transparent face plate 26" at column 3, line 57).

The Combination:

It would have been obvious at the time the invention was made to one of ordinary skill in the art to utilize a single image pickup apparatus as taught by Lia, in place of the two cameras of Uomori, in order to capture both images by selectively inserting the window into the optical path as taught by Lia (i.e., at figures 2 and 4), in order to simplify the image pickup apparatus by obviating the problems associated with a two camera system, such as the "manufacturing" problems (Lia, column 1, line 37; the "cost" (Lia, column 3, line 40), the matching and

alignment (Lia, column 3, line 43) and bulk and weight associated with two cameras (Lia, column 1, lines 48-49).

Response to Arguments

7. Applicant's arguments filed on October 5, 2004 have been fully considered but they are not persuasive. At response page 9, applicant argues:

"Uomori neither discloses nor suggests moving one of the first image or the second image so that the object in the first image coincides with the object in the second image, as required by claim 1."

Examiner disagrees. Uomori discloses:

determining a position of an object in a first image (figure 18, "A_L"; "points AL and AR indicate the same point in the same object in the left and right images, respectively" at column 14, line 23);

determining a position of an object in a second image (figure 18, "A_R"; "points AL and AR indicate the same point in the same object in the left and right images, respectively" at column 14, line 23); and

moving one of the first image or the second image so that the object in the first image coincides with the object in the second image (figure 18, "Δx_{ave}"; "the right image is shifted ..." at column 14, line 27; "the entire images are moved horizontally" at column 14 line 33).

This aspect of Uomori fully meets the claimed requirements.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian P. Werner whose telephone number is 571-272-7401. The examiner can normally be reached on M-F, 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh M. Mehta can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Brian Werner
Primary Examiner
Art Unit 2621
May 24, 2005

BRIAN WERNER
PRIMARY EXAMINER